

VII. ECHINODERMATA

By AILSA M. CLARK

THE collection of Echinoderms includes many well-known littoral species which are widespread throughout the Indo-West Pacific area, as well as some which are peculiar to the Red Sea. A few species, notably the single Crinoid *Capillaster multiradiata* (Linnaeus) and an Echinoid, *Clypeaster fervens* Koehler, have not been previously recorded from the Red Sea.

The species are the following, all of them from low tide or low spring tide level except where otherwise stated. Those mentioned in more detail in the text are marked with an asterisk. References in the text giving further details are marked with a dagger.

	Locality	Number
ASTEROIDEA		
<i>Astropecten polyacanthus</i> Müller & Troschel	Dahab	1
	Ras Muhammad Bay	1
* <i>Fromia ghardaqana</i> Mortensen	Dahab	1
	Abu Zabad	3
* <i>Gomophia egyptiaca</i> Gray	Abu Zabad	1
<i>Linckia multifora</i> (Lamarck)	Sherm Sheik	2
	Dahab	1
	Sanafir I.	1
<i>Asterope carinifera</i> (Lamarck)	Abu Zabad	2
* <i>Asterina burtonii</i> Gray	Sanafir I.	1
	Dahab	1
	Sherm Sheik	1
	Abu Zabad	4
OPHIUROIDEA		
* <i>Ophiocoma pica</i> Müller & Troschel	Dahab	5
	Sherm Sheik	4
	Sanafir I.	5
	Mualla	1
	Tiran	3
	Abu Zabad	5
* <i>Ophiocoma scolopendrina</i> (Lamarck)	Sanafir I.	3
	Dahab	8
	Faraun Id.	10
	Sherm Sheik	4
	Abu Zabad	2
* <i>Ophiocoma erinaceus</i> Müller & Troschel	Dahab	2
	Sherm Sheik	1
	Sanafir I.	2
	Abu Zabad	2
<i>Ophiocoma valenciae</i> Müller & Troschel	Tiran	4
	Sanafir I.	1
	Sherm Sheik	1
	Abu Zabad	2
	Dahab	1
* <i>Ophiocoma</i> sp.	Sherm Sheik	1
* <i>Macrophiothrix hirsuta</i> (Müller & Troschel)	Sherm Sheik	1
	Sanafir I.	1
	Dahab	2

	Locality	Number
<i>Ophiotrichoides propinqua</i> (Lyman)	Dahab	2
* <i>Placophiothrix purpurea</i> (von Martens)	Dahab	1
<i>Ophiolepis cincta</i> Müller & Troschel	Dahab	5
	Abu Zabad	2
	Sherm Sheik	3

CRINOIDEA

* <i>Capillaster multiradiata</i> (Linnaeus)	Dahab	1
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ECHINOIDEA

<i>Eucidaris metularia</i> (Lamarck)	Sherm-el-Moiya	1
	Mualla	2
	Sherm Sheik	8
	Sanafir I.	2
	Tiran	7
<i>Diadema setosum</i> (Leske)	Aqaba	2
	Sherm-el-Moiya	1
	Tiran	1
	Faraun I.	1
	Abu Zabad	1
<i>Echinometra mathaei</i> (Blainville)	Mualla	1
	Abu Zabad	4
	Sherm Sheik	4
	Tiran	5
	Sanafir I.	4
	Dahab	10
<i>Heterocentrotus mammillatus</i> (Linnaeus)	Dahab	3
* <i>Triploneustes gratilla</i> (Linnaeus)	Abu Zabad	3
	Sanafir I.	1
	Dahab	6
	Aqaba	2
<i>Clypeaster humilis</i> (Leske)	Dahab	1
* <i>Clypeaster fervens</i> Koehler	Dahab	1
<i>Lovenia elongata</i> (Gray)	Dahab	1

HOLOTHUROIDEA

<i>Synapta maculata</i> (Chamisso & Eysenhardt)	Um Nageila (in shallow water off mangrove swamp)	1
<i>Synaptula recta</i> (Semper)	Sherm Sheik	1 (pt.)
<i>Halodeima edulis</i> (Lesson)	Dahab	1
	Abu Zabad	1
<i>Halodeima atra</i> (Jäger)	Abu Zabad	2
<i>Halodeima cinerascens</i> (Brandt)	Abu Zabad	1
<i>Holothuria impatiens</i> (Forskål)	Dahab	5
* <i>Holothuria sucosa</i> Erwe.	Dahab	1
<i>Holothuria pardalis</i> (Selenka)	Dahab	5
	Graa	2
<i>Holothuria curiosa</i> var. <i>pervicax</i> (Selenka)	Dahab	1
<i>Microthele difficilis</i> (Semper)	Abu Zabad	8
	Dahab	6
* <i>Microthele nobilis</i> (Selenka)	Ras Muhammad Bay	1
<i>Actinopyga miliaris</i> (Quoy & Gaimard)	Faraun I.	1

ASTEROIDEA

Family LINCKIIDAE

Fromia ghardaqana Mortensen

PL. 31, FIGS. a-c

Scytaster milleporellus, Müller and Troschel, 1842: 35; [non *Asterias milleporella* Lamarck, 1816: 564].

Fromia milleporella (part), Gray, 1866: 14.

Fromia monilis, Tortonese, 1935: 70; 1936: 213; [non *Fromia monilis* Perrier, 1875: 443 (p. 179 in repaged edition)].

Fromia ghardaqana Mortensen, 1938: 37.

Dahab, shore; 1 specimen. Abu Zabad, reef at low water springs; 3 specimens.

Description. $R = 40$ mm., $r = 10$ mm., $R/r = 4.0$. The arms taper evenly throughout their length to a rather pointed tip. One has been broken and is in process of regeneration. Of the five primary inter-radial plates, three are enlarged with a flat surface raised slightly above the level of the surrounding plates, the one adjacent to the madreporite is smaller but also a little elevated, while the fifth is not at all conspicuous. The madreporite is triangular in shape, with deep radiating grooves, and measures 1.4 mm. across.

The carinal row of plates is not very clear proximally, where all the plates are in fact rather irregularly arranged. At the base of the arm there are about seven plates across the width.

All the dorsal and ventral plates, as well as the marginals, are closely covered with uniform, smooth, rounded granules, about 7 in the length of 1 millimetre. These lie very close together and are polygonal on the convex plates, of which there are about 10 on the dorsal side of each arm, besides the primary inter-radial plates and the marginals. Most of the convex plates are near the tip of the arm, but an irregular series of spaced plates occupies the mid-radial distal area.

The number of supero-marginal plates varies between 19 and 21 on the four complete arms, with the same number in each infero-marginal series. The latter plates are relatively narrower and are noticeably longer than broad. In the distal half of the arm they may bear a small tubercle in the centre as also do the last two supero-marginals. These plates, unlike the infero-marginals, are not evenly sized but, especially distally, large and small plates tend to alternate with one another, the larger ones being rather convex. The two series of marginal plates tend to alternate in position.

On the ventral side the papulae are clearly visible in the angles between the plates. The granules surrounding each one are not markedly larger than the other granules. Proximally there are 3 rows of papulae, correlated with the presence of 4 rows of ventro-lateral plates. The outermost row of these consists of only 4 plates on each side of the interbrachial angle, extending to the aboral end of the second infero-marginal plate. The third series reaches the seventh infero-marginal, the second to the eleventh plate, and the innermost series to the fourteenth.

The adambulacral plates bear 2, or, in the middle part of the arm, often 3 flattened furrow spines. Outside these is a single stumpy spine, shorter than the furrow spines though much thicker and slightly elongated in transverse section. On both sides of this spine and outside it are numerous granules like those of the ventro-lateral plates.

Remarks. Müller and Troschel's description of *Scytaster milleporellus* together with the locality of the Red Sea suggests that their specimens like many of Gray's were almost certainly *Fromia ghardaqana*. However, some of the latter, from Mauritius and other localities in the Indian Ocean, are the form (pl. 31, fig. *d*) with even-sized supero-marginal plates which is generally assumed to represent *Fromia milleporella*. Since Lamarck gave as the type locality 'les mers d'Europe?', and only a brief description, it is not certain which form really is *milleporella*. This question can only be answered by study of the type specimens if they are still in existence.

Mortensen has examined the type of *Fromia monilis* Perrier and finds it quite distinct from the Red Sea species, although he does not give any details.

On comparison of the specimen described with one of *F. monilis* from Macclesfield Bank, South China Sea, with $R = 35$ mm., it is at once seen that the granulation of the dorsal side of the latter is very much finer with at least 10 granules to a millimetre rather than only 7. Also the arms of *F. monilis* are relatively much narrower with R/r about 4.5 on average and the supero-marginal plates usually occupy more of the dorsal surface of the arm, so that only 3 or 5 rows of plates, rarely more, lie across the base of the arm. On the ventral side the granules around the pores are clearly enlarged unlike those of *F. ghardaqana*.

Unfortunately there are no specimens of *Fromia pacifica* H. L. Clark (the species that Mortensen says is most nearly related to *F. ghardaqana*) in the British Museum to compare with the material from the Red Sea. That Torres Strait species apparently has even-sized supero-marginal plates and pointed granules rather than flat ones.

There are also three juvenile specimens in the present collection, the two larger ones having $R = 18$ mm., but whereas one is much more slender with an R/r ratio of 3.5:1, the other has the ratio only 2.8. Of the many old dry specimens in the British Museum, the R/r value varies between 3.0 and 3.7, although a co-type of *F. ghardaqana* from Ghardaqa sent by Dr. Mortensen has the ratio 4.0. This it seems is just about the maximum value.

From all the other species of *Fromia*, *F. ghardaqana* is easily distinguished by the alternate large and small distal supero-marginals.

Gomophia egyptiaca Gray

Pl. 32

Gomophia egyptiaca Gray, 1840: 286. H. L. Clark, 1921: 55.

†*Scytaster aegyptiacus*, Perrier, 1875: 428 (p. 164 in re-paged edition).

Nardoa aegyptiaca, de Loriol, 1891: 30. Fisher, 1906: 1087. Koehler, 1910: 157, pl. xvii. 5, 6.

Abu Zabad, reef at low water springs; one specimen.

$R = 84$ mm., while the type has $R = 62$ mm. The intermarginal plates in the arm angle are not more conspicuous than in the type and indeed are quite hidden by the granulation in one of the angles.

Range. Red Sea, Mauritius, Samoa, Philippines, Fiji, Macclesfield Bank.

Family ASTERINIDAE

Asterina burtonii Gray

Asterina burtonii Gray, 1840: 289. †G. A. Smith, 1927: 641.

Asteriscus wega Perrier, 1869: 102.

Asterina wega Perrier, 1876: 238 (p. 318 of re-paged edition).

Sanafir; one specimen. Dahab; one 6-armed specimen. Abu Zabad; 4 specimens. Sherm Sheik; one 7-armed specimen.

Remarks. Since in 1876 Perrier corrected the error in his original description of *A. wega*, regarding the number of spines on each ventro-lateral plate, emending it to 2 or 3 rather than 1, there seems to be no reason why specimens with up to 8 arms should not be regarded as *Asterina burtonii*. Smith accepts 6-armed specimens as such. These forms with more than 5 arms are usually juvenile and more or less obviously in process of regeneration. The 7-armed specimen in the present collection has 4 arms diminutive. Perrier states that all his thirteen specimens of *A. wega* were undergoing regeneration.

2. OPHIUROIDEA

Family OPHIOMIDAE

Ophiocoma pica Müller & Troschel

Ophiocoma pica Müller & Troschel, 1842: 101. H. L. Clark, 1921: 127, pl. xiii, 8 (coloured).

†Ely 1942: 54, pl. xii, B.i., text-fig. 15.

Ophiocoma lineolata Müller & Troschel, 1842: 102. de Loriol, 1893: 28.

Dahab; 5 specimens. Sherm Sheik; 4 specimens. Sanafir; 5 specimens. Mualla; 1 specimen. Tiran; 3 specimens. Abu Zabad; 5 specimens. All from coral at low tide.

Remarks. These specimens are easily distinguished from the other *Ophiocomas* collected by the conspicuous stripes on the otherwise black arms and the yellowish stripes on the disk. The ratio of arm length to the disk diameter varies between 3.6 and 4.8:1.

Note. It has been accepted for a very long time that *O. pica* and *O. lineolata* are synonymous, but both names have been retained by different authors. For instance Koehler (1922a: 324) still uses *lineolata* although most other recent authors prefer *pica*. However, the latter name had page priority in Müller & Troschel's *System der Asteriden*. So in spite of its previous use in manuscript by Valenciennes, which has no validity, the name *Ophiocoma lineolata* should be dropped.

Ophiocoma scolopendrina (Lamarck)

Ophiura scolopendrina Lamarck, 1816, 2: 544.

†*Ophiocoma scolopendrina*, de Loriol, 1893: 23. H. L. Clark, 1921: 125, pl. xiii, 9. †Koehler, 1922a: 325, pls. lxxiii, 5; lxxiv, 1-7.

Sanafir; 3 specimens. Dahab; 8 specimens. Faraun Island; 10 specimens. Sherm Sheik; 4 specimens. Abu Zabad; 2 specimens. All from the shore under stones.

Remarks. The colour ranges from variegated bluish grey to dense black on the dorsal side of the disk and arms, the ventral side of the disk being always pale. Most have the arms broken but they are usually relatively long, six or more times the disk diameter.

Ophiocoma erinaceus Müller & Troschel

Ophiocoma erinaceus Müller & Troschel, 1842: 98. †de Loriol, 1893: 21. H. L. Clark, 1921: 127. †Ely, 1942: 52, text-fig. 45, pl. xiiia.

Dahab: 2 specimens. Sherm Sheik; 1 specimen. Sanafir; 2 specimens. Abu Zabad: 2 specimens.

Remarks. Except for the two specimens from Abu Zabad, these are densely black all over; even the tentacles of those from Dahab are black; also the arms are relatively short, the ratio of arm length to disk diameter being 4-4.8:1. The Abu Zabad specimens are also densely black dorsally but are pale on the underside of the disk, although the tentacles are black. The arms of one are all broken but in the other their length is nearly seven times the disk diameter. They are thus intermediate between *O. scolopendrina* (with relatively long arms and lighter colour) and *O. erinaceus*, with shorter arms and a uniformly dark colour, so there was some doubt as to which species they should be. Finally they were referred to the latter species for the following reasons: besides the very dense black colour on the dorsal side, the disk granulation hardly extends below the periphery and there are two tentacle scales for quite a large part of the arm, as in *erinaceus*. Also, apart from these morphological characters, the fact that they were taken well out on the reef at low spring tide level in the same zone as *Ophiocoma pica* suggests that they belong to *erinaceus*, for H. L. Clark makes the distinction of habitat of the two forms *scolopendrina* and *erinaceus* an important reason for maintaining them as separate species, the former characteristically occupying a higher level on the shore which is uncovered at ordinary low tides.

I fully agree with Ely that very rarely can several characters be used to distinguish intermediate specimens as belonging to one or the other species. Quite often conflicting results are obtained by using two different characters. For instance there is a specimen in the British Museum collection from Muscat, with the proportions 170 mm./21 mm. = 6.4:1, which would on this count be called *scolopendrina*, but the unrelievedly black colour on the contrary suggests that it is *erinaceus*. In such cases only a detailed observation of the habit and habitat can produce a conclusive identification.

Ophiocoma sp.

Sherm Sheik; 1 specimen.

This is a very small specimen (disk diameter = 5 mm.) with all the arms broken and a hole through the centre of the disk. It is nearest to *O. pica* as there are 2 tentacle scales, 5 slender arm spines proximally, and dark bands on the arms, also the oral shields are longer than wide. However, the dorsal side of the disk is unusual in having black spots each surrounded by a lighter ring on a dark brown background. These spots vary in size and shape but are relatively much larger than those of *Ophiocoma döderleini*.

Family OPHIOTRICHIDAE

Placophiothrix purpurea (von Martens)

Ophiothrix purpurea von Martens, 1867: 346. Döderlein, 1896: 296, pls. xiv. 12; xvii. 23.

†*Ophiothrix lepidus* de Loriol, 1893: 45, pl. xxv. 1.

†*Ophiothrix fallax* de Loriol, 1893: 47, pl. xxv. 2.

Placophiothrix purpurea, H. L. Clark, 1939: 86.

Dahab; 1 specimen.

This specimen agrees very closely with de Loriol's description of *Ophiothrix fallax* from Mauritius, as it has a pale green disk and relatively long arms (disk diameter = 4.5 mm., arm length = 45 mm.). H. L. Clark has declared *O. lepidus* de Loriol to be a synonym of *O. purpurea*, from a study of the long series of specimens obtained by the John Murray Expedition. He makes no mention of *O. fallax*, but as the characters of that species are intermediate between those of the other two, it certainly comes within the range of variation of *Placophiothrix purpurea*.

Possibly Döderlein's *Ophiothrix lorioli* (1896: 297) from Amboina, with radial shields similar to those of *O. lepidus*, is also a synonym of *purpurea*. Both Döderlein and Koehler (1898: 102) say that *O. lepidus* and *O. lorioli* cannot be confounded, but neither of them give any reason for this.

Macrophiothrix hirsuta (Müller & Troschel)

Ophiothrix hirsuta Müller & Troschel, 1842: 111. Marktanner-Turneretscher, 1887: 311. †Koehler, 1922a: 234, pls. xxxi. 1, 2; xxxiii. 13; xcix. 2. Tortonese, 1949: 37.

Ophiothrix cheneyi Lyman, 1861: 84.

Macrophiothrix hirsuta, H. L. Clark, 1938: 285.

Ophiothrix demessa, H. L. Clark, 1939: 83. [non *Ophiothrix demessa* Lyman, 1861: 82.]

Sherm Sheik; 1 specimen. Sanafir; 1 specimen. Dahab; 2 specimens.

Remarks. There seems to be considerable difference of opinion as to the shape of the dorsal arm-plates in this species. H. L. Clark describes them as more or less oval in his key to the species of *Macrophiothrix*, but as Tortonese points out, Müller & Troschel's original description mentions lateral angles, a statement open to several interpretations but suggesting at least something a little more angular than an ellipse. Koehler's plate 83, fig. 13, of the arm of a Philippine specimen shows dorsal arm-plates of which the widest part is midway between proximal and distal edges, whereas all the Red Sea specimens that I have seen have the widest part distinctly distal to the half-way line with a slightly rounded angle as opposed to the very acute angle of *M. longipeda*. This rather fan-shaped form is shown in Koehler's plate 31, fig. 1, of a specimen from the Red Sea, which also resembles the present material in the characters of the disk. That the shape of the dorsal arm-plates varies in different parts of the range is shown by the fact that Lyman's species from Zanzibar, *O. cheneyi*, which is commonly accepted as a synonym of *M. hirsuta*, is described as having oval, microscopically granulated dorsal arm-plates.

The latter feature, that is the presence of more or less thorny granules on the dorsal arm-plates, is not mentioned by Müller & Troschel, but Marktanner-Turner-etscher states that they are always somewhat granulated although this is not so marked as in *O. demessa*. In fact he considers the difference in the size and thorniness of these granules to be the only difference separating the two species. Through the courtesy of Dr. Elisabeth Deichmann I have had the opportunity of studying some specimens of *O. demessa* and as a result fully agree with Marktanner-Turner-etscher, the only other difference that I can see being that the arms seem to taper more rapidly, in younger specimens at least, of *O. demessa*. The granules on the arms are distinctly more thorny than in the specimens from the Red Sea, where they may be quite unobtrusive in spirit specimens. H. L. Clark in his John Murray Report names two specimens from the Red Sea and the Gulf of Aden *Ophiothrix demessa*, of which the one in the British Museum is indistinguishable from *M. hirsuta*, and I suspect that Koehler's record of *O. demessa* from the Red Sea is also based on a similar specimen. In 1946 H. L. Clark erected a new genus *Amphiophiothrix* to accommodate the species *O. demessa*, but I cannot agree that there is a generic distinction between it and *Macrophiiothrix hirsuta*.

The validity of some of the other Indo-Pacific species of *Macrophiiothrix* has been questioned by several authorities. Some of them are possibly variants of other species such as *hirsuta* in which the granulation of the radial shields is reduced, for there is a tendency for such a reduction throughout the genus as there is also for the development of granules on the dorsal arm-plates, a character featuring in the descriptions of several species, such as *M. rugosa* H. L. Clark, and noticeable also in some larger specimens of other species. However, without seeing the types and being able to compare them with large series of specimens from different parts of the Indo-Pacific, it is impossible to add anything concrete to the suspicions already voiced.

3. CRINOIDEA

Family COMASTERIDAE

Capillaster multiradiata (Linnaeus)

Asterias multiradiata, Linnaeus, 1758: 663.

Capillaster multiradiata, A. H. Clark, 1909: 364.

†*Capillaster multiradiata*, A. H. Clark, 1931: 173, pls. iii. 5; xi. 30; xiii. 34; xiv. 35, 36; lxxxii. 222, 223, also many text-figs.

Dahab; 1 specimen; arms 90 mm. in length.

This is the first record of this species from the Red Sea, the former known range being from Formosa south to northern Australia and west as far as the Maldive Islands, so its discovery here is most interesting.

There are 36 arms, which is rather more than usual; A. H. Clark gives 12 to 35 as the usual range, but quotes specimens with up to 43 arms.

4. ECHINOIDEA

Family TOXOPNEUSTIDAE

Tripneustes gratilla (Linnaeus)

Echinus gratilla Linnaeus, 1758: 664.

Tripneustes gratilla, Loven, 1887: 77. †Mortensen, 1943, 3 (2): 500, pls. xxxiii. 1-3; xxxiv. 2-6; xxxv. 3-4; xxxvii. 1-2, 4-10; xxxviii. 1-4; lvi. 11.

Abu Zabad, reef at low spring tide; 3 specimens. Sanafir; 1 specimen. Dahab; 6 specimens. Aqaba; 2 specimens.

The two from Aqaba are superficially very different from the others, having relatively few and long primary spines above the ambitus, which are white in colour and contrast sharply with the dark purple of the test, produced mainly by the numerous pedicellariae. The tube feet of these two specimens are black or at least have a black band around them. The other specimens are more drab in colour, several being slightly reddish and their tube feet are grey. The denuded tests are distinctly green aborally.

Family CLYPEASTRIDAE

Clypeaster (Rhaphidoclypus) fervens Koehler

Clypeaster fervens Koehler, 1922: 45, pls. vi. 1, 2, 6; xv. 1.

†*Clypeaster (Rhaphidoclypus) fervens*, Mortensen, 1948, 4 (2): 84, pls. xiii. 2, 3; xxii. 1-11; xxvi. 2; lxv. 7-9, 12, 20.

Dahab, shore; 1 dead test.

This specimen is easily distinguished from *Clypeaster humilis* by the relatively large petals and the concave oral side. It is 46 mm. in length but already has well-developed genital pores. According to Dr. Mortensen (who has very kindly confirmed my identification) in his monograph, the genital pores only begin to appear when the length is about 56 mm., that is in the John Murray Expedition material from the Indian Ocean. It seems then that in the Red Sea this species undergoes precocious genital development.

5. HOLOTHUROIDEA

Family HOLOTHURIIDAE

Holothuria sucosa Erwe

Cucumaria hartmeyeri Helfer, 1912: 332. [non *Holothuria hartmeyeri* Erwe, 1913: 383, pl. vii. 19.]

†*Holothuria sucosa* Erwe, 1919: 186, text-fig. 5. Panning, 1934, 3: 80, text-fig. 64.

? *Holothuria ocellata*, Tortonese, 1936: 235, text-figs. 5, 6.

Dahab; 1 specimen.

The knobbed buttons have 4 or 5 pairs of holes, sometimes as many as 10 pairs. Unlike *H. arenicola* var. *boutani* Herouard, which also has multilocular, though flat buttons, the tables, which are also larger, have a complete ring of holes around the margin not interrupted by the extended four central holes. Unlike *H. ocellata* Jäger, the great majority of buttons have more than 3 pairs of holes.

Microthele nobilis (Selenka)

Mulleria nobilis Selenka, 1867: 31, pl. xvii. 13-15.

†*Holothuria (Microthele) nobilis*, Panning, 1929, 1: 131, text-fig. 15.

Microthele nobilis, Heding, 1940: 320.

Ras Muhammad; 1 specimen.

Although shrunken in preservation this specimen still measures 24 cm. in length. The tables have mostly rather irregular disks. The other dorsal deposits are 'three-dimensional buttons', fenestrated irregularly with about 4 pairs of holes on each face. Ventrally, however, these spicules are much outnumbered by more conventional flat buttons with holes in one plane, there being usually 4 or 5 pairs of holes if not more.

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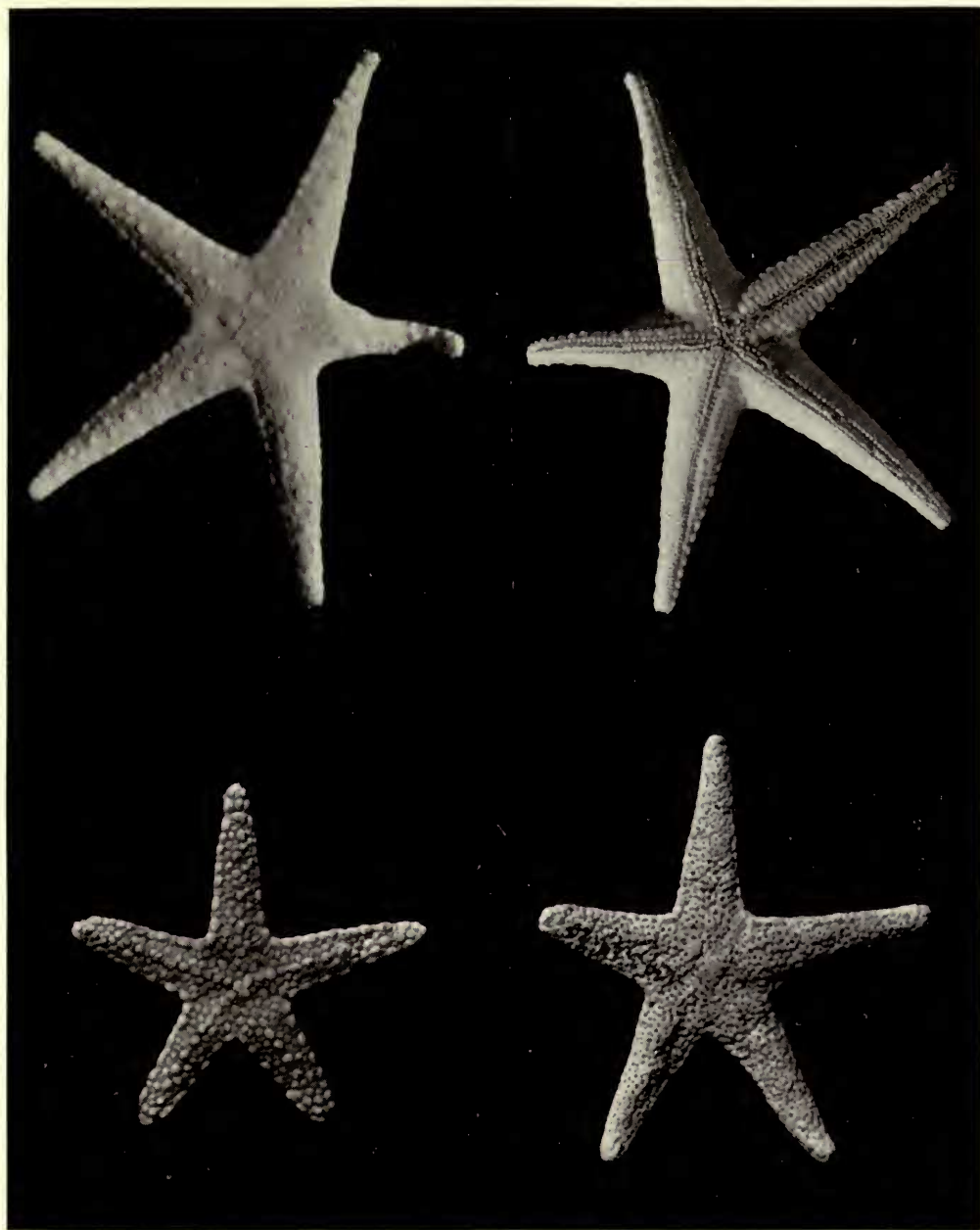
Legends to Plates 31 and 32

PLATE 31

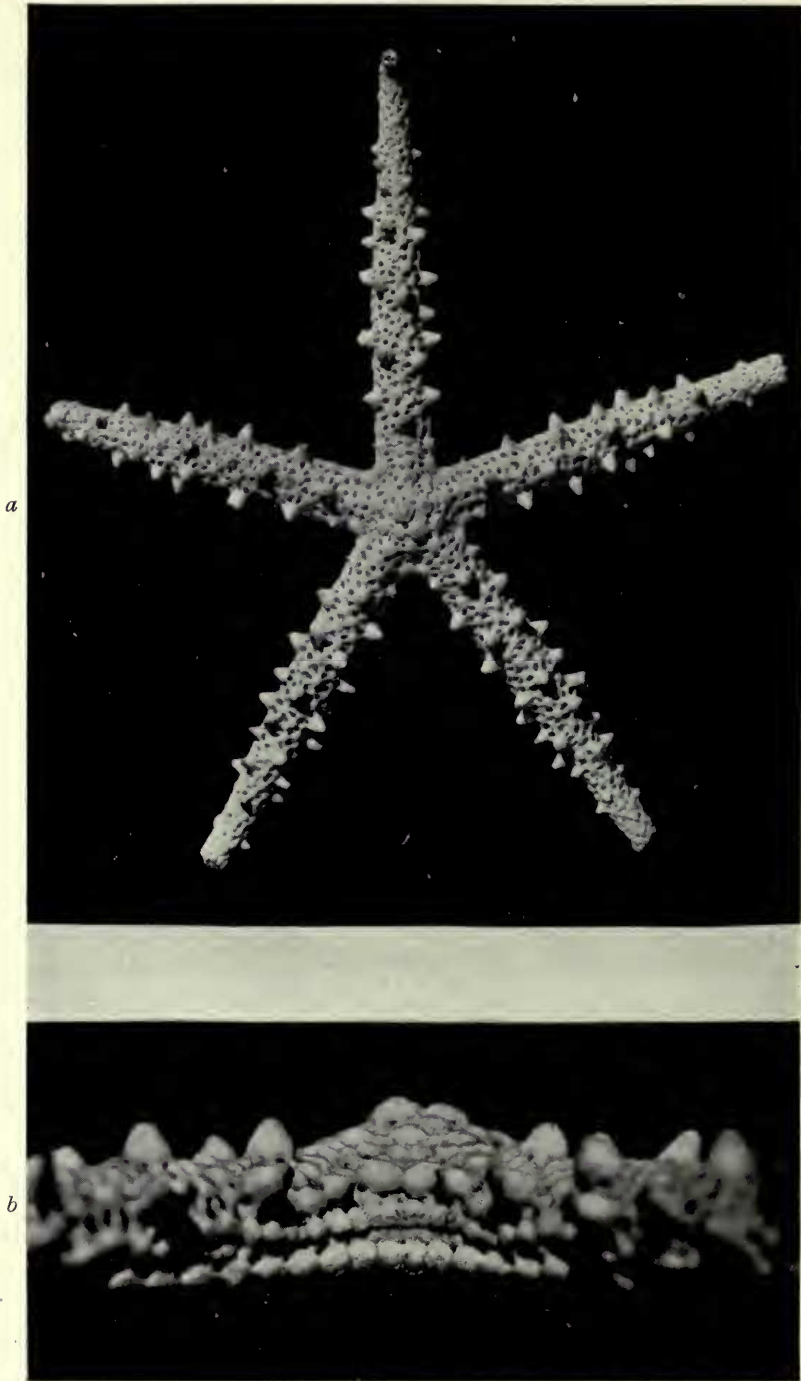
Fromia ghardaqana Mortensen, specimen from Dahab. (a) Dorsal side; (b) ventral side; (c) specimen 40.3.23.35; and (d) *Fromia milleporella* Lamarck, specimen 39.3.29.20, for comparison.

PLATE 32

Gomophia egyptiaca Gray. (a) Dorsal side of the type and (b) an inter-brachial angle to show the intermarginal plates.



FROMIA GHARDAQANA MORTENSEN (Figs. *a-c*)
FROMIA MILLEPORELLA LAMARCK (Fig. *d*)



GOMOPHIA EGYPTIACA GRAY